



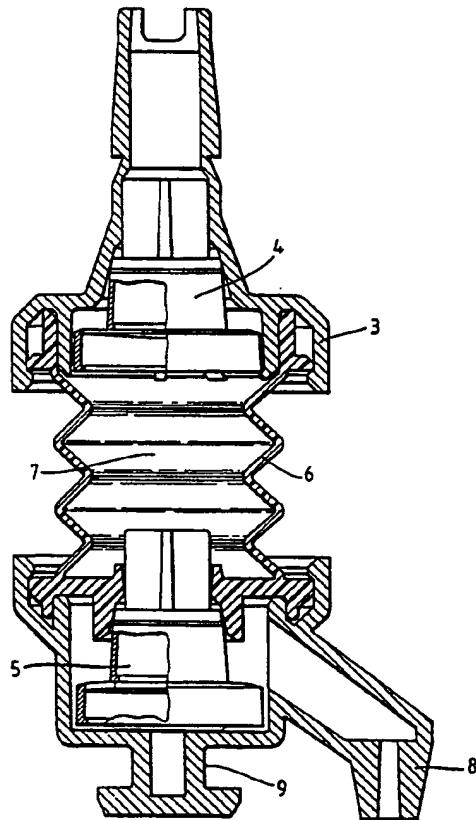
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(71) Applicant (for AU BB CA GB IE LK MN MW NZ SD only): UNILEVER PLC [GB/GB]; Unilever House, Blackfriars, London EC4 4BQ (GB).			
(71) Applicant (for all designated States except AU BB CA GB IE LK MN MW NZ SD): UNILEVER N.V. [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL).			
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(54) Title: LIQUID DISPENSER

(57) Abstract

There is provided a dispenser for delivering aliquots of a liquid product comprising a housing (1) and a disposable refill package which is positioned inside the housing and comprises a collapsible reservoir (2) for the liquid product fitted with a bellow pump (3), whereby the bellow pump comprises an inlet valve (4) and an outlet valve (5) and is manually operable via indirect actuating means (10, 11), and whereby the housing is provided with a narrow opening into which a correspondingly shaped portion (9) of the bellow pump located near the outlet valve thereof, can be securely fitted.



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Liquid Dispenser

Technical Field of the Invention

The present invention is concerned with a dispenser of the kind for delivering aliquots of a liquid product from a reservoir by means of a pump which is manually operable. Such dispensers are often used in washrooms etc. for dispensing small amounts of a liquid soap product for hand washing purposes.

10

Background and Prior Art

Various dispensers of the above-indicated kind have been described in the literature. For example, the US-patent 4,256,242 (Christine) discloses a liquis soap dispenser comprising a housing, a collapsible bag for holding the liquid soap product and an operating lever or handle for actuating controlled amounts of soap from the bag. The collapsible bag is connected to an outlet by means of a flexible conduit which comprises a pump. These known types of dispensers offer hygiene and ease of handling for the user. However, one problem with this kind of dispensers resides in the fact that only a small amount of liquid soap may be dispensed at the time due to the limited capacity of the peristaltic type of pump applied. The amount is usually not more than 0.5 to 1 ml.

Another problem which has been encountered with this type of pump is related to the way the pump operates: after the pump has been actuated the pump tubing recovers to its original shape and thereby sucks in liquid product for the next shot. This sucking action of the tubing is directly related to the memory properties thereof which could decline depending on the material of the tubing and the operating time of the pump. As a consequence, the dosage of the pump per shot could decline.

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In order to overcome this problem, it has been proposed in the British patent application 2 103 296 to provide the dispenser with a bellow pump fitted with an external spring. As a result of this spring, the recovery properties 5 of the bellow pump can be optimized to such extent that even liquid products of high viscosity can be satisfactorily applied in this dispenser. For reasons of easy handling, the dispenser disclosed by this document comprises a disposable refill which comprises a reservoir 10 and the bellow pump.

However, the disclosed dispenser is a rather specific one in that it can only be activated by electromagnetic means.

It is an object of the present invention to provide a 15 dispenser of the afore-mentioned kind, which does not possess these and other disadvantages. It is also an object to provide a dispenser which can be simply constructed, is user-friendly, and can be easily refilled.

We have now found that these and other objects can be 20 achieved by the dispenser of the present invention.

DEFINITION OF THE INVENTION

The present invention provides a dispenser for delivering aliquots of a liquid product comprising a housing (1) and a 25 disposable refill package which is positioned inside the housing and comprises a collapsible reservoir (2) for the liquid product fitted with a bellow pump (3), whereby the bellow pump comprises a product inlet valve and a product outlet valve and is manually operable via indirect actuating means (10,11), and whereby the housing is provided with a narrow opening (9) into which a correspondingly shaped portion of the bellow pump located near the outlet valve thereof, can be securely fitted.

The present invention also provides a disposable refill 35 package suitable for use in a dispenser according to the invention, comprising a collapsible reservoir (2) filled with a liquid product and attached thereto a bellow pump

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(3) provided with a narrow portion (9) which can be securely fitted into a correspondingly shaped opening located in the housing (1) of the dispenser.

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DETAILED DESCRIPTION OF THE INVENTION

Preferably, the disposable refill package applied in the dispensing system of the present invention comprises a reservoir which is made of plastic material such as

5 polyethylene, polypropylene and PVC. For reasons of convenience and in order to reduce the risk that the liquid to be dispensed is contaminated when installing a new refill, the refill is made of one piece.

10 The bellow pump comprises a liquid inlet valve and a liquid outlet valve which are respectively closed and opened by manually operable actuating means during each dose. Immediately after each dose, when the liquid outlet valve is closed, the liquid inlet valve is opened by the suction

15 action of the bellow when it recovers to its original position. As a result, full liquid communication with the reservoir is achieved and the internal volume of the bellow pump is refilled by liquid sucked in from out of the reservoir.

20 As a consequence of this action of the liquid inlet and outlet valves present in the bellow pump during and immediately after each dose, no air can enter the internal volume of bellow pump and reservoir and the risk of contamination of the liquid to be dispensed is minimized.

25 The material of the bellow pump is preferably such that the suction action of the bellow pump is kept more or less constant, also after many dosages have been done. When the dispenser is used for dispensing more viscous

30 types of liquid, the bellow pump is preferably equipped with an external spring. This spring ensures that constant dosage volumes are obtained during the operating life of the dispenser even with highly viscous liquids because it forces the bellow pump back into its original shape after

35 each dose.

In order to ensure that the refill package is easily and

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securely fitted in the housing of the dispenser, the housing is provided with a narrow opening into which a correspondingly shaped portion of the bellow pump located near the outlet valve thereof can be fitted. Furthermore,

5 this narrow opening ensures that only refill packs containing the desired type of liquid product will be mounted in the dispenser, because other packs containing different products simply will not fit.

This narrow opening is desirably in the form of a slit

10 having a width of less than 5 mm, preferably less than 2 mm.

The bellow pump is desirably provided with a discharge tube comprising a flow channel having a narrow internal opening

15 with a diameter of less than 3 mm, preferably less than 2 mm. The advantage of this type of discharge tube is that the flow rate of the liquid product flowing out of the bellow pump during each dose, is increased due to the narrow internal opening, which proved to have a self-

20 cleaning effect on the flow channel. The possibility of bacterial growth entering the valve is thereby further diminished.

For reasons of ease of handling, the dispenser of the

25 present invention is equipped with manually operable indirect actuating means. These may practically comprise a push rod which is coupled to the bellow pump via a tilting table.

30 The internal volume of the reservoir gradually decreases when liquid product is taken out and dispensed. When the reservoir is pumped empty, underpressure is created and, as a consequence, the bellow of the pump will be kept in a collapsed position. The resulting reduction in length of

35 the bellow pump can be used as an empty pack indicator.

Dispensers comprising a bellow pump with a dosing capacity

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of from about 0.1 to 10 ml are very suitable for use in washrooms. This type of dispensers having a dosing capacity in the mentioned range can be made much more compact than dispensers with peristaltic or plunger pumps with the same
5 dosing capacity.

The invention will now be better explained by way of the preferred embodiment shown in the accompanying drawings of which:

10 Figure 1 shows cross-sectional views of a dispenser according to the invention including a housing, a collapsible reservoir and a bellow pump, whereby the bellow pump is not activated (a) respectively activated (b);
Figure 2 shows a cross-sectional view of the bellow pump,
15 including an inlet and outlet valve, and a discharge tube.

In Figure 1, a housing (1) is shown comprising a refill package which comprises a reservoir (2) and a bellow pump (3). The dispenser can be manually operated with indirect
20 actuating means comprising a push rod (10) which is coupled to a tilting table (11) which in turn is connected to the bellow pump (3).

As shown in Figure 1, a narrow portion (9) is connected to the bellow pump (3) which portion is used for securely
25 positioning the refill package in the housing of the dispenser. Furthermore, the bellow pump is provided with a discharge tube (8) which comprises a flow channel having a narrow internal opening.

It can also be noticed that an external spring (12) is
30 present between tilting table (11) and the housing. This spring ensures that constant volumes are dosed even when applying high viscosity liquids.

Figure 2 shows a bellow pump provided with an inlet valve
35 (4), an outlet valve (5) and a bellow section (6). Because the internal volume of the bellow pump contains the liquid to be dispensed during the next dose, the bellow pump

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functions as a type of dosing section.

It is emphasized that the dispenser shown in the Figure
illustrates only a preferred embodiment of the invention
5 and that various constructional alternatives will be im-
mediately evident to the man skilled in the art, without
departing from the scope of the present invention.

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CLAIMS

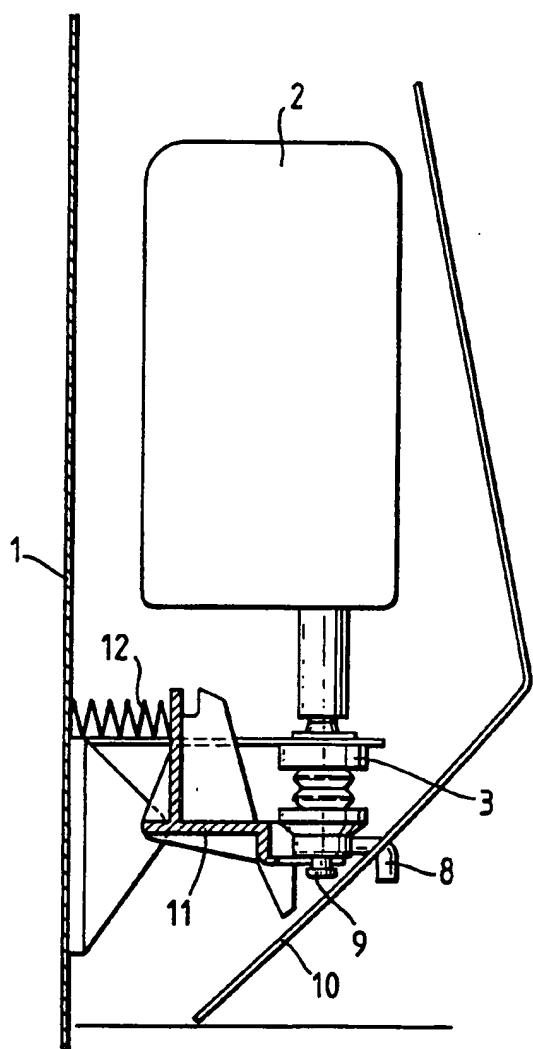
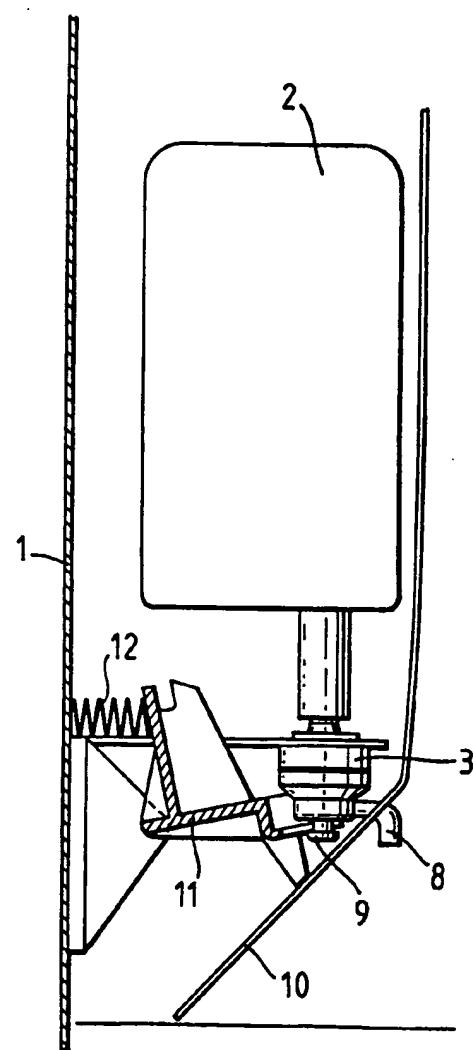
1. A dispenser for delivering aliquots of a liquid product comprising a housing (1) and a disposable refill package 5 which is positioned inside the housing and comprises a collapsible reservoir (2) for the liquid product fitted with a bellow pump (3), whereby the bellow pump comprises an inlet valve (4) and an outlet valve (5) and is manually operable via indirect actuating means (10,11), and whereby 10 the housing is provided with a narrow opening into which a correspondingly shaped portion (9) of the bellow pump located near the outlet valve thereof, can be securely fitted.
- 15 2. A dispenser according to claim 1, wherein the bellow pump is provided with an external spring (12).
3. A dispenser according to claim 1 or 2, wherein the narrow opening in the housing (1) is in the form of a slit 20 having a width less than 5 mm, preferably less than 2 mm.
4. A dispenser according to any of claims 1-3, wherein the bellow pump is provided with a discharge tube (8) comprising a flow channel having a diameter of less than 3 25 mm, preferably less than 2 mm.
5. A dispenser according to any of claims 1-4, wherein the bellow of the bellow pump is kept in a collapsed position as a result of the underpressure created when the reservoir 30 is pumped empty.
6. A dispenser according to any of claims 1-5, wherein the bellow pump has a capacity of from about 0.1 to about 10 ml.

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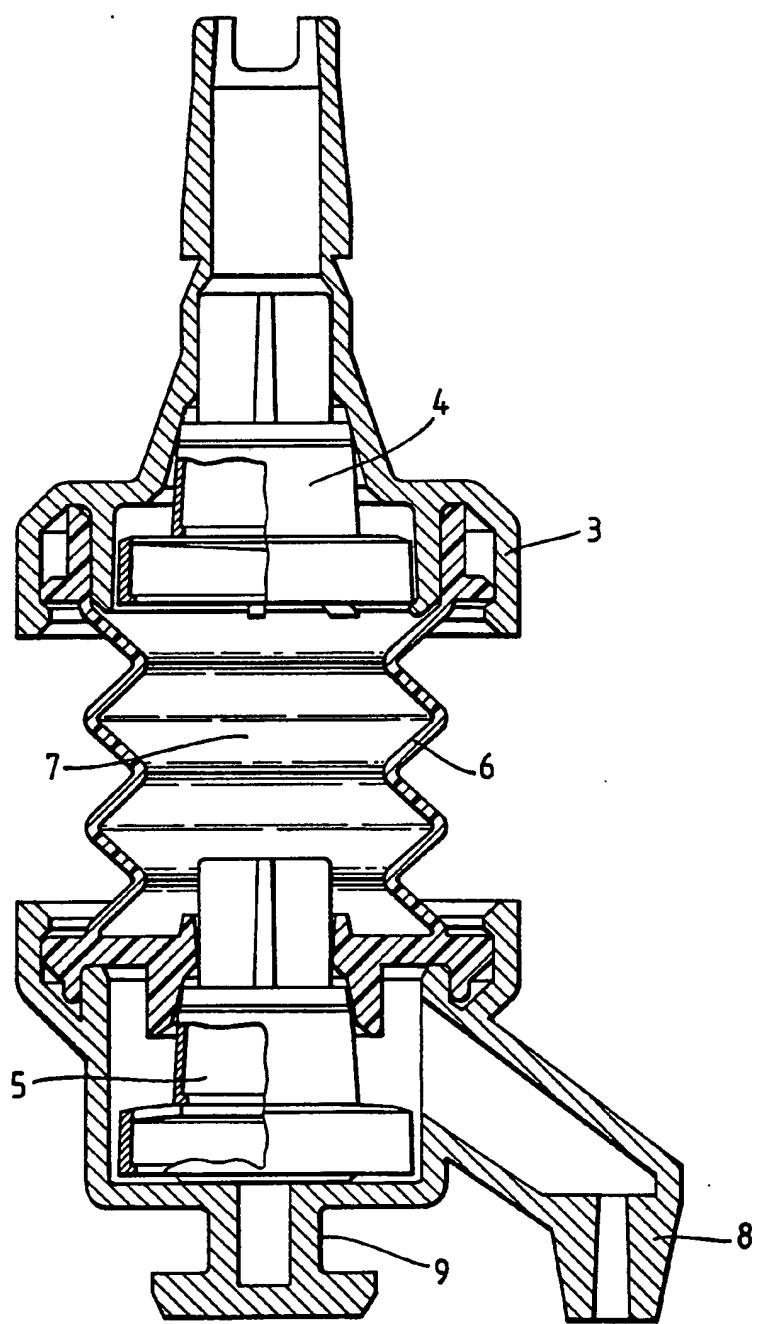
7. A disposable refill package suitable for use in a dispenser according to any of claims 1-5, comprising a collapsible reservoir (2) filled with a liquid product and
- 5 attached thereto a bellow pump (3) provided with a narrow portion (9) which can be securely fitted into a correspondingly shaped opening located in the housing (1) of the dispenser.

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Fig. 1(a)*Fig. 1(b)*

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Fig. 2.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 93/02382

A. CLASSIFICATION OF SUBJECT MATTER IPC 5 G01F11/08
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols) IPC 5 G01F A47K
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT
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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE,A,27 27 679 (O. KAISER) 9 November 1978 see page 6, paragraph 2; figure 1 ---	1
A	EP,A,0 304 567 (R. ANDRIS) 1 March 1989 see column 6, line 22 - column 7, line 26; figure 1 ---	1
A	US,A,4 978 036 (W.D. BURD) 18 December 1990 see column 2, line 59 - column 4, line 14; figures 1,2,10,11 ---	1
A	FR,A,2 392 366 (SOC. PRODENE) 22 December 1978 see page 6, line 11 - page 7, line 5; figure 1 --- -/-	1

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Date of the actual completion of the international search

1 December 1993

Date of mailing of the international search report
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A	US,A,4 256 242 (W.C. CHRISTINE) 17 March 1981 cited in the application see column 2, line 7 - column 6, line 51; figures 1-8 ---	1
A	FR,A,2 502 774 (DAGMA) 1 October 1982 see page 7, line 1 - page 13, line 35; figures 1-3 ->	1
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Information on patent family members

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PCT/EP 93/02382

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GB-A-2103296		NL-A-	8200969	18-10-82